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Public perception to the knowledge of venous thromboembolism among Saudi Arabia 2020: A cross-sectional study

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ABSTRACT

Introduction: DVT deaths are caused by massive pulmonary embolism (PE) due to the migration of the formed thrombus, but awareness of DVT or PE was significantly higher among those with a personal or family history of VTE. Participants had positive perceptions of thromboprophylaxis and were satisfied with the treatment (> 69%). The main study objective was to measure the awareness of VTE by conducting a local quantitative research study to address this knowledge gap among adults in Saudi Arabia 2020. *Methods:* A cross-sectional study was conducted among the adult Saudi population all over the country. The data were gathered using a special, predesigned self-administered electronic questionnaire translated to Arabic. The study included adult Saudis over 18 years old. *Results:* Majority of the study respondents had a bachelor's education (329 of 559). There were only 8 (1.6%) respondents aged above 65, while the majority age group was between 25 years and 39 years at 42.6%. Most people would prefer to get healthcare information from doctors or healthcare professionals (50.3%). Education level, however, was statistically significantly associated with both the knowledge of DVT and PE $p < .01$ in both cases. *Conclusion:* The knowledge of DVT and PE is still low, with about a third of the Saudi general population informed. However, the fact that about 60% of the respondents know about the symptoms of DVT and PE is a sign of a positive attitude towards the knowledge of DVT and PE within the general population.

Keywords: Deep venous thrombosis (DVT), pulmonary embolism (PE) thromboprophylaxis.

1. INTRODUCTION

Deep venous thrombosis (DVT) is an aspect of venous thromboembolism (VTE). DVT is the presence of coagulated blood in one of the deep veins of the

body, often presenting with pain and swelling or manifesting asymptomatically (Bagga et al. 2020). Is a serious disease with potentially effective preventive measure and high rates of complications and deaths without treatment? The incidence of VTE is 1-3 per 100 patients per year, while the incidence of massive pulmonary embolism (PE) is estimated to be 200 diagnosed cases per 1,000,000 inhabitants per year in western countries (Essam et al., 2011; Di Minno et al., 2016). Early detection and appropriate management of DVT save many lives from complications and deaths. Prevention of VTE is considered a patient-safety-oriented measure in most mandated quality initiatives. The measures for the prevention of VTE include mechanical methods (graduated compression stockings and intermittent pneumatic compression devices) and pharmacologic agents. A combination of mechanical and pharmacologic methods produces the best results. Patients undergoing surgery should be stratified according to their risk of VTE based on patient risk factors, disease-related risk factors, and procedure-related risk factors. The type of prophylaxis should be commensurate with the risk of VTE based on the composite risk profile (Laryea & Champagne, 2013; Cordeanu et al., 2019).

In a study done in King Abdulaziz Medical City, Riyadh, Saudi Arabia, 15% reported knowledge of deep vein thrombosis (DVT) and pulmonary embolism (PE). However, awareness of DVT or PE was significantly higher among those with a personal or family history of VTE. Participants had positive perceptions of thromboprophylaxis and were satisfied with the treatment (> 69%) but perceived its adverse effects less favorably and reported lower satisfaction with the information provided about DVT and PE (46%), (Almodaimegh et al., 2017). Our research objective is to evaluate the Saudi people's knowledge and awareness of DVT. As with any prevalent condition, it's important to prevent it in a high-risk population which includes old individuals, immobilized patients, pregnant women, long car or plane trips, multiple trauma patients, etc. (Olaf & Cooney, 2017; Devis & Knuttinen, 2017). The object of our research would be instrumental in assessing the need for further education and edification campaigns and solving the area of deficit in the current knowledge of DVT, DVT complications, and prophylaxis among the populace. We anticipate that the population understands some key facts about DVT but also misunderstands the magnitude and effect of this problem.

2. METHODOLOGY

A cross-sectional study was conducted among the adult Saudi population all over the country. The data were gathered using a special predesigned self-administered electronic questionnaire translated to Arabic with close-ended multiple-choice questions to assess the awareness about VTE (including DVT and PE) in Saudi Arabia, 2020. The study included adult Saudis over 18 years old. Respondents who did not achieve the inclusion criteria and those with incomplete data were excluded from the study. The first part of the questionnaire was about the personal information of the participants, while the second part was to assess the knowledge of, attitudes towards, and practices related to VTE. The desired sample size was determined using the margin of error formula as below:

$$n = z^2 * \frac{s^2}{e^2}$$

$z = 1.96$ is the z-score statistic at 95% confidence interval, s^2 is the desired variation from the centre of the data. Since a 5-point Likert scale was used, s was determined as $s = \frac{max-min}{range} = \frac{5-1}{4} = 1$. The standard errors were selected at 10%, the minimum value of n was then determined as:

$$n = 1.96 * \frac{1^2}{.1^2} = 384.16$$

However, given that the study was an inference design study; more sample member was allowed into the study. The final sample consisted of 559 respondents.

Data analysis was carried out using the Statistical Package for Social Sciences (SPSS) version 25. Qualitative data were expressed as number and percentage and Chi-Squared test was used to assess the relationship between variables. A p-value was considered significant less than 0.05.

The Ethical clearance for the study was obtained from the ISNC Research and Ethics Committee (IEC Ref No.: H-08-24122020). The participants were informed about the purpose of the study and their right to refuse participation. Ethical conduct was maintained during data collection and throughout the research process in accordance with the Helsinki Declaration. Participation in the study was confidentiality of the participants was maintained as the questionnaire was provided anonymously. Each participant had the right to withdraw from the study at any point without any consequences.

3. ANALYSIS AND RESULTS

Majority of the study respondents had a bachelor's education (329 of 559), while the frequency of respondents who had knowledge of Deep Vein Thrombosis (DVT), who were unsure about DVT, and who had no knowledge of DVT did not vary significantly at the 5% level (p=.146). The number of respondents with knowledge about pulmonary embolism (PE) who did not have this knowledge and the number of individuals who were unsure was significantly different at 5% (p=.001). There were only 8 (1.6%) respondents who aged above 65, while the majority age group was between 25 years and 39 years at 42.6%. Most people would prefer to get healthcare information from doctors or healthcare professionals (50.3%), compared to internet sources (40.3%), or family and friends (3.6%). About the knowledge of risk factor 330 (59.1%) of our sample they know about provoked risk factors for (DVT) while 172 (30.8%) were not sure about it in other hand the knowledge about prevention 430 (76.9%) correct identified while 129 (23.1%) isn't sure about it, Demographic descriptive information is provided in more details in (table 1).

Table 1 Frequency table (n=559)

Variable		Freq. (%)	p-value
Age	18-24	228(40.8)	.000
	25-39	238(42.6)	
	40-46	85(15.2)	
	65>	8(1.4)	
Education level	18-24	329(58.7)	.000
	25-39	192(34.2)	
	40-46	35(6.3)	
	65>	2(.4)	
Knowledge of DVT	No	178(31.8)	.146
	Unsure	173(30.9)	
	Yes	208(37.2)	
Knowledge of PE	No	210(37.6)	.001
	Unsure	144(25.8)	
	Yes	205(36.7)	
Method of learning about DVT/PE	Healthcare professional	174(31.1)	.000
	Family or friend	101(18.1)	
	Internet	9(1.6)	
	Magazine/newspaper/ television	68(12.2)	
	Other	5(.9)	
	Never heard of DVT/PE	202(36.1)	
Symptoms of DVT	Correctly identified	333(59.6)	.000
	Not sure	226(40.4)	
Symptoms of PE	Correct	387(69.3)	.000
	Not sure	172(30.8)	
Risk factor for a deep vein thrombosis or pulmonary embolism	Correct identified	330(59.1)	.000
	Not sure	229(40.9)	
Prevention for a deep vein thrombosis/ pulmonary	Correct identified	430(76.9)	.000
	Not sure	129(23.1)	
Preferred method of obtaining health	Family and friends	20(3.6)	
	Internet	225(40.3)	

information	Magazine/newspapers/ books/television	24(4.3)	.000
	Other	9(1.6)	

The main risk factors known for VTE development were malignancy, history of long-term immobility, obesity, and orthopedic operations (45%, 25%, 16.5%, and 13.5%, respectively) (figure 1).

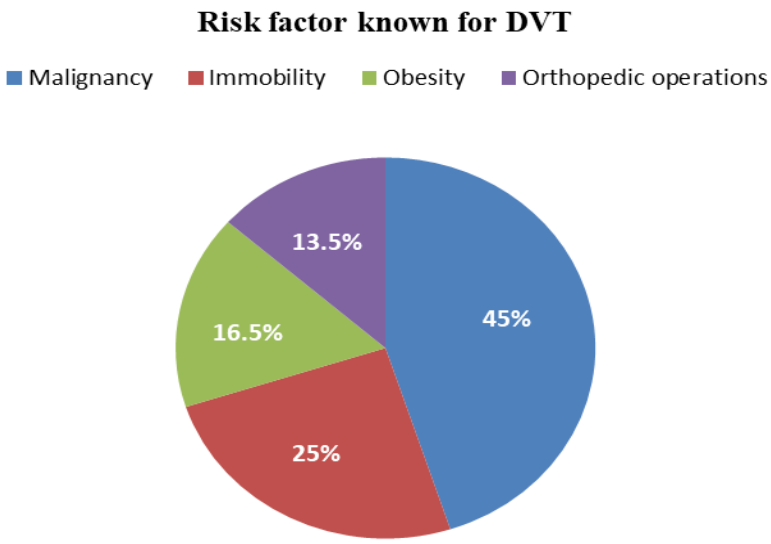
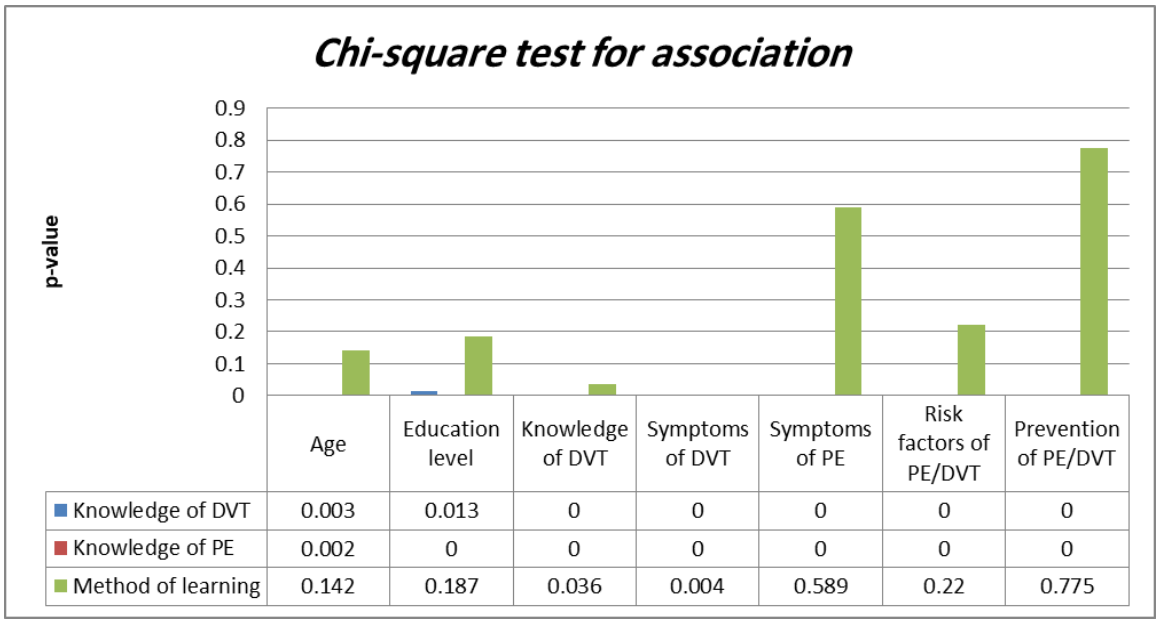


Figure 1 known Risk factor DVT (n=559)

The method of learning about DVT/PE and knowledge of symptoms of DVT/PE were statistically associated, p=.004. The former variable was also statistically associated with the knowledge of DVT, p=.036. However, age group, education level, and knowledge of risk factors for both DVT and PE were not statistically associated with the method which respondents used to learn about the two diseases. Education level was, however, statistically significantly associated with both knowledge about DVT and knowledge about PE $p < .01$ in both cases. Figure 2 presents the results of chi-square tests for association.



	Age	Education level	Knowledge of DVT	Symptoms of DVT	Symptoms of PE	Risk factors of PE/DVT	Prevention of PE/DVT
Knowledge of DVT	0.003	0.013	0	0	0	0	0
Knowledge of PE	0.002	0	0	0	0	0	0
Method of learning	0.142	0.187	0.036	0.004	0.589	0.22	0.775

Figure 2 Chi-square test for association (n=559)

4. DISCUSSION

The main aim of the present study was to explore and assess knowledge about blood vessel disorders, DVT, and PE across the Saudi region. The primary design of the study was thus a cross-sectional descriptive design of the risk factors and the knowledge of symptoms of DVT and PE. In a sample of 559 respondents comprising adult males and females (at least 18 years of age), a significant difference in the frequency of demarcations of each age group was discovered. Our sample by age-group composition differed from the sample by Elkhadir et al., (2018), where the average age of the respondents was 56 years, and Almodaimegh et al., (2017), where the modal age group was between 51 years and 70 years. The difference may have been brought by the fact that the two respective studies were conducted on patients with venous disease, while our study was focused on the general population (Heit et al., 2000). Given that the sample had only less than 1% of respondents with the highest education level being the primary education level, the sample can be considered generally informed. This is possibly the reason there was a knowledge prevalence of DVT at 37.2% and knowledge prevalence of PE at 36.7%. However, there was no statistically significant difference in the number of respondents across the levels of knowledge of DVT. The fact that 59.6% of the respondents correctly identified symptoms of DVT while 69.3% correctly identified symptoms of PE, in comparison to the number of respondents who, respectively, said they knew about DVT (37.2%) and (PE 36.7%), could be an effect of an educated sample.

In old age (typically older than 60 years), the risk of pulmonary embolism increases by two-fold for every ten-year increase from age 60 (Engbers et al., 2010). The risk of PE rises with the increase in conditions such high blood pressure, paralysis and DVT. The latter two conditions are primarily caused by reduced movement (Barco et al., 2019). In the present study, the knowledge of the prevalence of DVT and PE, respectively, was associated with age group, education level, and the respondents' knowledge of the risk factors of DVT ($p<.01$) in all cases. These findings resonate with those of Almodaimegh et al., (2017), where knowledge of DVT and PE were associated with demographic variables age. In their findings, older people appeared more knowledgeable in DVT and PE than younger people, $p<.05$, while education level did not significantly associate with knowledge of DVT and PE. Given that few people knew about the DVT and PE, this could be the reason that individual symptoms, risk factors, and prevention measures of DVT and PE were significantly associated with the knowledge condition of DVT (yes, no or not sure) and knowledge condition of PE (yes, no or not sure). The fact that most people learn about health issues from doctors and health professionals, typically when they or their family members or friends suffer from a certain condition, could explain the significant association between the method of learning and knowledge of DVT and PE respectively ($p<.05$ in both cases).

5. CONCLUSION

In conclusion, the descriptive design study presented here showed that the knowledge of DVT and PE is still low with only about a third of the Saudi general population informed. However, the fact that about 60% of the respondents know about the symptoms of DVT and PE signals a positive attitude towards the knowledge of DVT and PE within the general population.

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Criteria for inclusion in the authors'/ contributors' list

Dr.Hydi Ahmed: designed the study, developed the questionnaire and the informed consent, wrote the protocol and planed the study. She helped in statistical design and analysis. She will take the primary responsibility in responding to the reviewers' comments. Dr. Razan M. Alzahrani: designed the study, developed the questionnaire and the informed consent, wrote the protocol and planed the study. She helped in statistical design and analysis. She will take the primary responsibility in responding to the reviewers' comments. Dr Ibrahim A. Alshardi: designed the study, developed the questionnaire and the informed consent, wrote the protocol and planed the study. She helped in statistical design and analysis. She will take the primary responsibility in responding to the reviewers' comments. Dr.Abdulmalek A. Aboulkhair: designed the study, developed the questionnaire and the informed consent, wrote the protocol and planed the study. She helped in statistical design and analysis. She will take the primary responsibility in responding to the reviewers' comments. Dr.Amal B. Alzahrani: designed the study, developed the questionnaire and the informed consent, wrote the protocol and planed the study. She helped in statistical design and analysis. She will take the primary responsibility in responding to the reviewers' comments.

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Conflict of Interest

The authors declare that there are no conflicts of interests.

Informed consent

Written & Oral informed consent was obtained from all individual participants included in the study. Additional informed consent was obtained from all individual participants for whom identifying information is included in this manuscript.

Ethical approval

Ethical approval is obtained from the ISNC Research and Ethics Committee (IEC Ref No.: H-08-24122020).

Data and materials availability

All data associated with this study are present in the paper.

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